

REMARKS

Claims 1-29 are pending in the present application.

Claims 1-29 have been rejected.

Claims 1, 6, 8-9, 11, 15-16, 18-19, 21-26 and 28-29 have been amended.

Claims 1-29 remain in the case.

Reconsideration of Claims 1-29, as amended, is respectfully requested.

Specification

In Paragraph 1 on Page 2 of the September 13, 2002 Office Action, the Examiner objected to the specification because a cross reference to a co-pending related application was identified with the Applicants' attorney's docket number. The specification has been amended to replace the docket number with a Patent Application Serial Number. This amendment makes the change that was requested by the Examiner.

35 U.S.C. § 102(b) Anticipation

In Paragraphs 2-3 on Pages 2-3 of the September 13, 2002 Office Action, the Examiner rejected Claims 1-2, 4, 6, 11-12, 14 and 16 under 35 U.S.C. § 102 (b) as being anticipated by United States Patent No. 5,123,425 to *Shannon, Jr. et al.* (hereafter “*Shannon*”).

The Examiner stated “In regards to claims 1 & 11, Shannon discloses an apparatus for terminating an obstructive sleep apnea event even before cessation of breath occurs comprising at least one microphone (24 and supporting text) which detects breathing sounds and which generates signals representative of such; a controller (20) coupled to the microphone capable of receiving such breathing sound signals and identifying signals indicative of the onset of obstructive sleep apnea / a partially occluded airway event and capable of generating an alarm signal (col.3 lines 25-50), and a stimulus generator (26 & 28 and supporting text) capable of receiving such alarm signals creating a stimulus to cause said person to move in a manner that causes said obstructive sleep apnea / partial occlusion event to terminate.” (September 13, 2002 Office Action, Paragraph 3, Pages 2-3).

The Applicants respectfully traverse the Examiner’s assertion that the *Shannon* reference discloses an apparatus for terminating an obstructive sleep apnea event even before cessation of breath occurs. The *Shannon* reference does not disclose this feature. Cessation of breathing must occur before the *Shannon* apparatus can detect the presence of an obstructive sleep apnea event.

The Applicants also respectfully traverse the Examiner’s assertion that the *Shannon* apparatus is capable of identifying signals that indicate “the onset of obstructive sleep apnea / a partially

occluded airway event.” The Applicants’ invention is capable of identifying the “onset” (i.e., the beginning) of an obstructive sleep apnea event before the obstructive sleep apnea event (i.e., cessation of breathing) actually occurs. The *Shannon* apparatus is not able to do this. Cessation of breathing must occur before the *Shannon* apparatus can detect the presence of an obstructive sleep apnea event. Further, the *Shannon* reference does not mention “a partially occluded airway event.” There is nothing in *Shannon* that suggests or event hints at “a partially occluded airway event” that occurs at the onset of an obstructive sleep apnea event.

In order to clarify that the Applicants’ invention detects the onset of an obstructive sleep apnea event before cessation of breathing occurs, the Applicants have amended Claims 1, 6, 8-9, 11, 15-16, 18-19, 21-26 and 28. The *Shannon* apparatus does not teach the concept of detecting the onset of an obstructive sleep apnea event before cessation of breathing occurs. Therefore, the Applicants respectfully submit that the amended claims of this patent application are not anticipated by *Shannon*.

It is clear from the language of the *Shannon* reference that *Shannon* uses the word “onset” to mean the beginning of an actual apnea event when breathing ceases. For example, the output of the *Shannon* sensor “is conditioned and interpreted, and used to determine whenever an apnea event is initiated.” (*Shannon*, Col. 2, Lines 42-44) (Emphasis added). That an “apnea event” requires the “cessation of breathing” may be seen from the language of Claim 1 of *Shannon*: “An apparatus for treating obstruction of an upper air passageway of a patient (Emphasis added).

The *Shannon* reference does not disclose the concept of detecting the onset of an apnea event before cessation of breathing occurs. Like a number of prior art systems *Shannon* is capable of detecting an apnea event by determining the presence or absence of breathing. *Shannon* does not indicate the existence of an apnea event if breathing is present. "Sensor 24 is used to determine the onset of an apnea episode. In the preferred embodiment, this is a microphone or motion sensor which generates an electrical signal corresponding to the presence of breath or snoring sounds." (Emphasis added) (*Shannon*, Column 3, Lines 25-29). The electronic circuit 200 of *Shannon* activates a stimulation signal (using on-time timer 208, ramp generator 209 and pulse generator 210) when sensor 24 no longer detects any "presence of breath or snoring sounds." This shows that in *Shannon* the onset of an apnea event begins when cessation of breathing occurs. *Shannon* does not analyze breath sounds that are associated with an onset of an apnea event before cessation of breathing occurs. *Shannon* does not detect a signal that indicates that an apnea event will occur.

For the reasons set forth above, Applicants respectfully submit that amended Claim 1 contains unique and novel limitations and that amended Claim 1 is not anticipated by the *Shannon* reference. Applicants also respectfully submit that Claim 11, Claim 21, Claim 28 and Claim 29 also contain unique and novel limitations and that Claim 11, Claim 21, Claim 28 and Claim 29 are not anticipated by the *Shannon* reference. Claims 2 through 10 depend from and contain all the unique and novel limitations contained in amended Claim 1. Claims 12 through 20 depend from and contain all the unique and novel limitations contained in amended Claim 11. Claims 22 through 27

depend from and contain all the unique and novel limitations contained in amended Claim 21. Therefore, Claims 1-29 are not anticipated by the *Shannon* reference.

The Applicants respectfully request that the rejection of Claims 1-2, 4, 6, 11-12, 14 and 16 under 35 U.S.C. §102(b) as anticipated by the *Shannon* reference be withdrawn and that Claims 1-29, as amended, be passed to issue.

35 U.S.C. § 103(a) Obviousness

In Paragraphs 4-5 on Pages 3-4 of the September 13, 2002 Office Action, the Examiner rejected Claims 7-8, 10, 17-18 and 20 under 35 U.S.C. § 103 (a) as being obvious in view of *Shannon*. The Examiner also rejected Claims 21-22 and Claims 24-29 as being obvious in view of *Shannon*.

In Paragraph 6 on Pages 4-5 of the September 13, 2002 Office Action, the Examiner rejected Claims 9 and 19 under 35 U.S.C. § 103 (a) as being unpatentable over *Shannon* in view of United States Patent No. 5,058,600 to *Schechter et al.* (hereafter "*Schechter*").

In Paragraph 7 on Pages 5-6 of the September 13, 2002 Office Action, the Examiner rejected Claims 3 and 13 under 35 U.S.C. § 103 (a) as being unpatentable over *Shannon* in view of United States Patent No. 5,652,566 to *Lambert*. The Examiner also rejected Claim 23 as being obvious in view of *Shannon* and *Lambert*.

In Paragraph 8 on Pages 6-7 of the September 13, 2002 Office Action, the Examiner rejected Claims 5 and 15 under 35 U.S.C. § 103 (a) as being unpatentable over *Shannon* in view of United States Patent No. 6,011,477 to *Teodorescu et al.* (hereafter "*Teodorescu*").

The Applicants respectfully traverse (1) the Examiner's rejection of Claims 7-8, Claim 10, Claims 17-18, Claims 20-22 and Claims 24-29 as being obvious in view of *Shannon*, (2) the Examiner's rejection of Claim 9 and Claim 19 as being obvious in view of *Shannon* and *Schechter*; (3) the Examiner's rejection of Claim 3, Claim 13 and Claim 23 as being obvious in view of *Shannon* and *Lambert*; and (4) the Examiner's rejection of Claim 5 and Claim 15 as being obvious in view of *Shannon* and *Teodorescu*. The Applicants respectfully request the Examiner to withdraw the rejections of the above referenced claims in view of the Applicants' amendments and the Applicants' remarks concerning the prior art references.

During *ex parte* examinations of patent applications, the Patent Office bears the burden of establishing a *prima facie* case of obviousness. MPEP § 2142; *In re Fritch*, 972 F.2d 1260, 1262, 23 U.S.P.Q.2d 1780, 1783 (Fed. Cir. 1992). The initial burden of establishing a *prima facie* basis to deny patentability to a claimed invention is always upon the Patent Office. MPEP § 2142; *In re Oetiker*, 977 F.2d 1443, 1445, 24 U.S.P.Q.2d 1443, 1444 (Fed. Cir. 1992); *In re Piasecki*, 745 F.2d 1468, 1472, 223 USPQ. 785, 788 (Fed. Cir. 1984). Only when a *prima facie* case of obviousness is established does the burden shift to the applicant to produce evidence of non-obviousness. MPEP § 2142; *In re Oetiker*, 977 F.2d 1443, 1445, 24 U.S.P.Q.2d 1443, 1444 (Fed. Cir. 1992); *In re*

Rijckaert, 9 F.3d 1531, 1532, 28 U.S.P.Q.2d 1955, 1956 (Fed. Cir. 1993). If the Patent Office does not produce a *prima facie* case of unpatentability, then without more the applicant is entitled to grant of a patent. *In re Oetiker*, 977 F.2d 1443, 1445, 24 U.S.P.Q.2d 1443, 1444 (Fed. Cir. 1992); *In re Grabiak*, 769 F.2d 729, 733, 226 USPQ 870, 873 (Fed. Cir. 1985).

A *prima facie* case of obviousness is established when the teachings of the prior art itself suggest the claimed subject matter to a person of ordinary skill in the art. *In re Bell*, 991 F.2d 781, 783, 26 U.S.P.Q.2d 1529, 1531 (Fed. Cir. 1993). To establish a *prima facie* case of obviousness, three basic criteria must be met. First, there must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the reference or to combine reference teachings. Second, there must be a reasonable expectation of success. Finally, the prior art reference (or references when combined) must teach or suggest all the claim limitations. The teaching or suggestion to make the claimed invention and the reasonable expectation of success must both be found in the prior art, and not be based on an applicant's disclosure. MPEP § 2142.

Applicants respectfully submit that the Patent Office has not established a *prima facie* case of obviousness with respect to the Applicants' invention. The Applicants direct the Examiner's attention to amended Claim 1 which shows novel and unique features:

1. [Amended] An apparatus for terminating an obstructive sleep apnea event before the cessation of breathing occurs, wherein the apparatus comprises:

at least one microphone capable of being acoustically associated with a person, said microphone capable of detecting breathing sounds within an airway of said person and capable of generating signals representative of said breathing sounds;

a controller coupled to said at least one microphone and capable of receiving said signals, said controller capable of identifying within said signals at least one signal pattern that is associated with a breathing pattern of said person that occurs at the onset of an obstructive sleep apnea event before cessation of breathing occurs, and capable of generating an alarm signal in response thereto; and

a stimulus generator coupled to said controller, said stimulus generator capable of receiving said alarm signal from said controller, and in response thereto, creating a stimulus to cause said person to move in a manner that causes said obstructive sleep apnea event to terminate. (Emphasis added).

The Applicants reiterate the arguments that the Applicants have previously made with respect to the *Shannon* reference. There is no teaching, suggestion or even a hint in the *Shannon* reference concerning the Applicants' novel and unique concept of detecting the onset of an obstructive apnea event before cessation of breathing occurs. A teaching or suggestion to make the Applicants' invention and a reasonable expectation of success is not found in the *Shannon* reference (or in any other prior art reference). Therefore, the Applicants' invention is not *prima facie* obvious in view of the *Shannon* reference.

The Examiner has stated that "In regard to claims 9 & 19, Shannon substantially discloses the instant application's claimed invention, but does not explicitly disclose using software with Fast Fourier Transform (FFT) analysis. However, Schechter discloses such (Note abstract statement that acoustic signals are processed using FFT). The references are analogous since they are from the same field of endeavor, the respiratory arts. At the time the instant application's invention was made, it would have been obvious to one of ordinary skill in the art to have taken the features of Schechter

and used them with the device of Shannon. The suggestion/motivation for doing so would have been to effectively process the acoustical data for diagnostic analysis. Therefore it would have been obvious to combine the references to obtain the instant application's claimed invention." (September 13, 2002 Office Action, Page 4, Lines 18-20 to Page 5, Lines 6). The Applicants respectfully traverse the Examiner's assertion that *Shannon* substantially discloses the Applicants' claimed invention. In particular, the Applicants respectfully traverse the Examiner's assertion that *Shannon* teaches all the limitations of Claims 9 and 19 except that the software analyzes the signals using a Fast Fourier Transform analysis. The Applicants also respectfully traverse the Examiner's assertion that it would have been obvious to combine the *Schechter* reference with the *Shannon* reference.

Claim 9 depends from amended Claim 8 (which, in turn, depends from amended Claim 1). Claim 19 depends from amended Claim 18 (which, in turn, depends from amended Claim 11). As previously described, *Shannon* does not analyze breath sounds that are associated with an onset of an apnea event before cessation of breathing occurs. *Schechter* discloses an expert diagnostic system that is designed to detect pathological obstructions and not temporary obstructions such as an obstructive apnea event. Even if *Schechter* apparatus could detect an obstructive apnea event it would not detect the obstructive apnea event until after the obstructive apnea event had occurred (i.e., until after the cessation of breathing had occurred).

The *Schechter* reference does not disclose a signal analysis template for detecting an obstructive apnea event or for detecting an onset of an obstructive apnea event. That is, there is no signal analysis mechanism in *Schechter* for detecting an obstructive apnea event. Therefore, unlike the Applicants' invention, the *Schechter* system will identify breath sounds that are associated with an "onset" of an obstructive apnea event as "normal" breath sounds. *Schechter* does not disclose, suggest, or even hint at the concept of using of spectral analysis techniques to detect an obstructive apnea event or to detect an onset of an obstructive apnea event.

Under the applicable patent law, there must be some teaching, suggestion or motivation to combine the *Shannon* reference and the *Schechter* reference. "When a rejection depends on a combination of prior art references, there must be some teaching, or motivation to combine the references." *In re Rouffet*, 149 F.3d 1350, 1355-56, 47 USPQ2d 1453, 1456 (Fed. Cir. 1998). "It is insufficient to establish obviousness that the separate elements of an invention existed in the prior art, absent some teaching or suggestion, in the prior art, to combine the references." *Arkie Lures, Inc. v. Gene Larew Tackle, Inc.*, 119 F.3d 953, 957, 43 USPQ2d 1294, 1297 (Fed. Cir. 1997). The Applicants respectfully submit that there exists no teaching, suggestion or motivation in the prior art to combine the teachings of the *Shannon* reference and the teachings of the *Schechter* reference.

When two references are combined the combination of the references must teach or suggest all the claim limitations. In the present case, even if the *Shannon* reference were combined with the

Schechter reference, the combination of the *Shannon* reference and the *Schechter* reference would not teach, suggest or even hint at the Applicants' invention. This is because, as previously described, the *Schechter* reference does not teach, suggest, or even hint at the Applicants' concept of using of spectral analysis techniques to detect an obstructive apnea event or to detect an onset of an obstructive apnea event. The Applicants respectfully submit that the rejections of Claims 9 and 19 under 35 U.S.C. §103(a) combining the *Shannon* reference and the *Schechter* reference should be withdrawn.

With respect to the rejection of Claim 3, Claim 13 and Claim 23, the Examiner has stated that "[I]t would have been obvious to one of ordinary skill in the art to have taken the features of Lambert and used them with the device of Shannon. The suggestion/motivation for doing so would have been to provide additional/redundant alarm systems, insuring the user is stimulated." (September 13, 2002 Office Action, Page 5, Lines 17-19). The Applicants respectfully traverse the Examiner's assertion that it would be obvious to combine the teaching of *Shannon* with the teachings of *Lambert*.

Claim 3 depends from amended Claim 1. Claim 13 depends from amended Claim 11. Claim 23 depends from amended Claim 21. Each of the amended independent claims contain a claim limitation restricting the detection of an onset of an obstructive apnea event to a time "before cessation of breathing occurs." This element is not present in *Shannon* or in *Lambert*.

Further, the reliability that is provided by the redundant alarm system of *Lambert* is not needed for the Applicants' invention. *Lambert* states that "Reliability is a critical requirement for

effective alarm systems. For example, in a hospital, a patient's life often depends on the effective operation of a medical monitor alarm.” (*Lambert*, Col. 1, Lines 1-13). The Applicants' invention is not a life saving monitor because people do not die from an episode of obstructive apnea. They always re-open an obstructed airway with the body's gasping reflex. Therefore, the level of reliability provided by the *Lambert* system is not required.

Under the applicable patent law, there must be some teaching, suggestion or motivation to combine the *Shannon* reference and the *Lambert* reference. Further, when two references are combined the combination of the references must teach or suggest all the claim limitations. In the present case, even if the *Shannon* reference were combined with the *Lambert* reference, the combination of the *Shannon* reference and the *Lambert* reference would not teach, suggest or even hint at the Applicants' invention. This is because, as previously described, the *Shannon* reference does not teach, suggest, or even hint at the Applicants' concept of detecting an apnea event “before cessation of breathing occurs.”

The Applicants respectfully submit that the rejections of Claim 3, Claim 13 and Claim 23 under 35 U.S.C. §103(a) combining the *Shannon* reference and the *Lambert* reference should be withdrawn.

With respect to the rejection of Claim 5 and Claim 15, the Examiner has stated that “At the time the instant application's invention was made, it would have been obvious to one of ordinary skill in the art to have taken the features of Teodorescu and used them with the device of

Shannon. The suggestion/motivation for doing so would have been to give the user more range/freedom of movement during use of the device. Therefore it would have been obvious to combine the references to obtain the instant application's claimed invention." (September 13, 2002 Office Action, Paragraph 8, Page 6).

Claim 5 depends from amended Claim 1. Claim 15 depends from amended Claim 11. Each of the amended independent claims contain a claim limitation restricting the detection of an onset of an obstructive apnea event to a time "before cessation of breathing occurs." This element is not present in *Shannon* or in *Teodorescu*.

Further, the supposed suggestion/motivation for combining the *Shannon* reference and the *Teodorescu* reference was said to be to give the user more range/freedom of movement during use of the device. But the user of the device is asleep during the time that the device is being used. The user is not moving in a manner that requires "more range/freedom of movement."

Under the applicable patent law, there must be some teaching, suggestion or motivation to combine the *Shannon* reference and the *Teodorescu* reference. Further, when two references are combined the combination of the references must teach or suggest all the claim limitations. In the present case, even if the *Shannon* reference were combined with the *Teodorescu* reference, the combination of the *Shannon* reference and the *Teodorescu* reference would not teach, suggest or even hint at the Applicants' invention. This is because, as previously described, the *Shannon*

reference does not teach, suggest, or even hint at the Applicants' concept of detecting an apnea event "before cessation of breathing occurs."

The Applicants respectfully submit that the rejections of Claim 5 and Claim 15 under 35 U.S.C. §103(a) combining the *Shannon* reference and the *Teodorescu* reference should be withdrawn.

The Applicants respectfully submit that Claims 1-29, as amended, are all patentable over the *Shannon* and the *Schechter* reference and the *Lambert* reference and the *Teodorescu* reference whether taken individually or in combination. The Applicants respectfully request that the rejection of Claims 1-29 be withdrawn and that Claims 1-29 be passed to issue.

The Applicants deny any statement, position or averment of the Examiner that is not specifically addressed by the foregoing argument and response. The Applicants reserve the right to submit further arguments in support of their above stated position as well as the right to introduce relevant secondary considerations including long-felt but unresolved needs in the industry, failed attempts by others to invent the invention, and the like, should that become necessary.

SUMMARY


For the reasons given above, the Applicants respectfully request reconsideration and allowance of pending claims and that this Application be passed to issue. If any outstanding issues remain, or if the Examiner has any further suggestions for expediting allowance of this Application, the Applicants respectfully invite the Examiner to contact the undersigned at the telephone number indicated below or at *wmunck@davismunck.com*.

The Commissioner is hereby authorized to charge any additional fees connected with this communication or credit any overpayment to Davis Munck Deposit Account No. 50-0208.

Respectfully submitted,

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Date: Jan. 13, 2003



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APPENDIX A
VERSION MARKED TO SHOW CHANGES MADE
IN THE SPECIFICATION:

Page 1, Lines 5-11 have been amended as follows:

The inventors of the present invention have filed a related patent application concurrently with this application entitled "System and Method for Detecting the Onset of An Obstructive Sleep Apnea Event" [(Attorney Docket No. ILIF01-00055)] as Patent Application Serial No. 09/641,982. The related patent application and the inventions disclosed therein are assigned to the assignee of the present invention and are incorporated herein by reference for all purposes as if fully set forth herein.

IN THE CLAIMS:

Claims 1, 6, 8-9, 11, 15-16, 18-19, 21-26 and 28-29 have been amended as follows:

1 1. [Amended] An apparatus for terminating an obstructive sleep apnea event before
2 [the] cessation of breathing occurs, wherein the apparatus comprises:
3 at least one microphone capable of being acoustically associated with a person, said
4 microphone capable of detecting breathing sounds within an airway of said person and capable of
5 generating signals representative of said breathing sounds;
6 a controller coupled to said at least one microphone and capable of receiving said signals,
7 said controller capable of identifying within said signals at least one signal pattern that is associated
8 with a breathing pattern of said person that occurs at the onset of an obstructive sleep apnea event
9 before cessation of breathing occurs, and capable of generating an alarm signal in response thereto;
10 and
11 a stimulus generator coupled to said controller, said stimulus generator capable of receiving
12 said alarm signal from said controller, and in response thereto, creating a stimulus to cause said
13 person to move in a manner that causes said obstructive sleep apnea event to terminate before
14 cessation of breathing occurs.

1 2. [Original] An apparatus as claimed in Claim 1 wherein said stimulus generator
2 comprises one of: a sound generator, a light source, a vibrator, and an electrical current source.

1 3. [Original] An apparatus as claimed in Claim 1 wherein said stimulus generator
2 comprises a vibrator and a sound generator.

1 4. [Original] An apparatus as claimed in Claim 1 wherein said stimulus generator
2 comprises a vibrator and an electrical current source.

1 5. [Original] An apparatus as claimed in Claim 1 further comprising a base station
2 coupled to said controller wherein said controller is capable of sending an alarm signal to said base
3 station to indicate that at least one signal pattern has been identified that is associated with a
4 breathing pattern of said person that occurs at the onset of an obstructive sleep apnea event before
5 cessation of breathing occurs.

1 6. [Amended] An apparatus as claimed in Claim 1 further comprising at least one
2 filter coupled between said at least one microphone and said controller, wherein said at least one
3 filter is capable of filtering said signals from said at least one microphone to create filtered signals
4 representative of said breathing sounds, and wherein said controller is capable of identifying within
5 said filtered signals at least one signal pattern that is associated with a breathing pattern of said
6 person that occurs at the onset of an obstructive sleep apnea event before cessation of breathing
7 occurs.

1 7. [Original] The apparatus as claimed in Claim 1 further comprising an airflow sensor
2 capable of detecting a flow of air within an airway of said person and capable of generating an
3 airflow detection signal that is representative of the presence of said flow of air; and
4 wherein said controller is coupled to said airflow sensor and is capable of receiving said
5 airflow detection signal from said airflow sensor to obtain information concerning the breathing of
6 said person.

1 8. [Amended] The apparatus as claimed in Claim 1 wherein said controller comprises
2 software capable of analyzing said signals to identify within said signals at least one signal pattern
3 that is associated with a breathing pattern of said person that occurs at the onset of an obstructive
4 sleep apnea event before cessation of breathing occurs.

1 9. [Amended] The apparatus as claimed in Claim 8 wherein said software analyzes
2 said signals using Fast Fourier Transform analysis to identify at least one signal pattern that is
3 associated with a breathing pattern of said person that occurs at the onset of an obstructive sleep
4 apnea event before cessation of breathing occurs.

1 10. [Original] The apparatus as claimed in Claim 1 wherein said controller operates
2 only during one half of the respiration cycle.

1 11. [Amended] An apparatus for terminating an obstructive sleep apnea event before
2 [the] cessation of breathing occurs, wherein the apparatus comprises:

3 at least one microphone capable of being acoustically associated with a person, said
4 microphone capable of detecting breathing sounds within an airway of said person and capable of
5 generating signals representative of said breathing sounds;

6 a controller coupled to said at least one microphone and capable of receiving said signals,
7 said controller capable of identifying within said signals at least one signal pattern that is associated
8 with a partially occluded breathing pattern of said person that occurs at the onset of an obstructive
9 sleep apnea event before cessation of breathing occurs, and capable of generating an alarm signal
10 in response thereto; and

11 a stimulus generator coupled to said controller, said stimulus generator capable of receiving
12 said alarm signal from said controller, and in response thereto, creating a stimulus to cause said
13 person to move in a manner that terminates the partial occlusion of breathing and restores normal
14 breathing.

1 12. [Original] An apparatus as claimed in Claim 11 wherein said stimulus generator
2 comprises one of: a sound generator, a light source, a vibrator, and an electrical current source.

1 13. [Original] An apparatus as claimed in Claim 11 wherein said stimulus generator
2 comprises a vibrator and a sound generator.

1 14. [Original] An apparatus as claimed in Claim 11 wherein said stimulus generator
2 comprises a vibrator and an electrical current source.

1 15. [Amended] An apparatus as claimed in Claim 11 further comprising a base station
2 coupled to said controller wherein said controller is capable of sending an alarm signal to said base
3 station to indicate that at least one signal pattern has been identified that is associated with a partially
4 occluded breathing pattern of said person that occurs at the onset of an obstructive sleep apnea event
5 before cessation of breathing occurs.

1 16. [Amended] An apparatus as claimed in Claim 11 further comprising at least one
2 filter coupled between said at least one microphone and said controller, wherein said at least one
3 filter is capable of filtering said signals from said at least one microphone to create filtered signals
4 representative of said breathing sounds, and wherein said controller is capable of identifying within
5 said filtered signals at least one signal pattern that is associated with a partially occluded breathing

1 pattern of said person that occurs at the onset of an obstructive sleep apnea event before cessation
2 of breathing occurs.

1 17. [Original] The apparatus as claimed in Claim 11 further comprising an airflow
2 sensor capable of detecting a flow of air within an airway of said person and capable of generating
3 an airflow detection signal that is representative of the presence of said flow of air; and
4 wherein said controller is coupled to said airflow sensor and is capable of receiving said
5 airflow detection signal from said airflow sensor to obtain information concerning the breathing of
6 said person.

1 18. [Amended] The apparatus as claimed in Claim 11 wherein said controller
2 comprises software capable of analyzing said signals to identify within said signals at least one signal
3 pattern that is associated with a partially occluded breathing pattern of said person that occurs at
4 the onset of an obstructive sleep apnea event before cessation of breathing occurs.

1 19. [Amended] The apparatus as claimed in Claim 18 wherein said software analyzes
2 said signals using Fast Fourier Transform analysis to identify at least one signal pattern that is
3 associated with a partially occluded breathing pattern of said person that occurs at the onset of an
4 obstructive sleep apnea event before cessation of breathing occurs.

1 20. [Original] The apparatus as claimed in Claim 11 wherein said controller operates
2 only during one half of the respiration cycle.

1 21. [Amended] A method for terminating an obstructive sleep apnea event before [the]
2 cessation of breathing occurs, comprising the steps of:
3 detecting breathing sounds within an airway of a person;
4 generating signals representative of said breathing sounds;
5 identifying within said signals at least one signal pattern that is associated with a breathing
6 pattern of said person that occurs at the onset of an obstructive sleep apnea event before cessation
7 of breathing occurs; and
8 creating a stimulus to cause said person to move in a manner that causes said obstructive
9 sleep apnea event to terminate before cessation of breathing occurs.

1 22. [Amended] The method as claimed in Claim 21 wherein said step of creating a
2 stimulus to cause said person to move in a manner that causes said obstructive sleep apnea event to
3 terminate before cessation of breathing occurs comprises one of the steps of:
4 generating a sound with a sound generator, activating a light source to turn on a light,
5 activating a vibrator, and generating an electrical current through the body of said person.

1 23. [Amended] The method as claimed in Claim 21 wherein said step of creating a
2 stimulus to cause said person to move in a manner that causes said obstructive sleep apnea event to
3 terminate before cessation of breathing occurs comprises the steps of:
4 activating a vibrator; and
5 generating a sound with a sound generator.

1 24. [Amended] The method as claimed in Claim 21 wherein said step of creating a
2 stimulus to cause said person to move in a manner that causes said obstructive sleep apnea event to
3 terminate before cessation of breathing occurs comprises the steps of:
4 activating a vibrator; and
5 generating an electrical current through the body of said person.

1 25. [Amended] The method as claimed in Claim 21 further comprising the steps of:
2 filtering said signals representative of said breathing sounds to create filtered signals
3 representative of said breathing sounds; and
4 identifying within said filtered signals at least one signal pattern that is associated with a
5 breathing pattern of said person that occurs at the onset of an obstructive sleep apnea event before
6 cessation of breathing occurs.

1 26. [Amended] The method as claimed in Claim 21 further comprising the steps of:
2 recording said at least one signal pattern that is associated with a breathing pattern of said
3 person that occurs at the onset of an obstructive sleep apnea event before cessation of breathing
4 occurs;
5 monitoring said signals representative of said breathing sounds as said person breathes;
6 comparing said signals representative of said breathing sounds with said recorded at least one
7 signal pattern that is associated with a breathing pattern of said person that occurs at the onset of an
8 obstructive sleep apnea event before cessation of breathing occurs; and
9 identifying within said signals a signal pattern that is substantially the same as said recorded
10 at least one signal pattern that is associated with a breathing pattern of said person that occurs at the
11 onset of an obstructive sleep apnea event before cessation of breathing occurs.

1 27. [Original] The method as claimed in Claim 21 wherein the step of detecting
2 breathing sounds within an airway of said person comprises:
3 detecting breathing sounds within said airway of said person only during one half of the
4 respiration cycle.

1 28. [Amended] A method for terminating an obstructive sleep apnea event before [the]
2 cessation of breathing occurs comprising the steps of:
3 detecting breathing sounds within an airway of a person;
4 generating signals representative of said breathing sounds;
5 identifying within said signals at least one signal pattern that is associated with a partially
6 occluded breathing pattern of said person that occurs at the onset of an obstructive sleep apnea event
7 before cessation of breathing occurs;
8 recording said at least one signal pattern that is associated with a partially occluded breathing
9 pattern of said person that occurs at the onset of an obstructive sleep apnea event before cessation
10 of breathing occurs;
11 monitoring said signals representative of said breathing sounds as said person breathes;
12 comparing said signals representative of said breathing sounds with said recorded at least one
13 signal pattern that is associated with a partially occluded breathing pattern of said person that occurs
14 at the onset of an obstructive sleep apnea event before cessation of breathing occurs;
15 identifying within said signals a signal pattern that is substantially the same as said recorded
16 at least one signal pattern that is associated with a partially occluded breathing pattern of said person
17 that occurs at the onset of an obstructive sleep apnea event before cessation of breathing occurs; and
18 creating a stimulus to cause said person to move in a manner that terminates the partial
19 occlusion of breathing and restores normal breathing.

1 29. [Amended] A method for terminating an obstructive sleep apnea event before [the]
2 cessation of breathing occurs comprising the steps of:
3 detecting breathing sounds within an airway of a person;
4 generating signals representative of said breathing sounds;
5 identifying within said signals at least one signal pattern that is associated with a normal
6 breathing pattern of said person;
7 recording said at least one signal pattern that is associated with a normal breathing pattern
8 of said person;
9 monitoring said signals representative of said breathing sounds as said person breathes;
10 comparing said signals representative of said breathing sounds with said recorded at least one
11 signal pattern that is associated with a normal breathing pattern of said person;
12 identifying within said signals a signal pattern that is substantially different from said
13 recorded at least one signal pattern that is associated with a normal breathing pattern of said person;
14 and
15 creating a stimulus to cause said person to move in a manner that restores normal breathing.